

Title (en)
PLASTIC SEMICONDUCTOR DEVICE AND ITS CONTROL METHOD

Publication
EP 0418504 A3 19910515 (EN)

Application
EP 90114130 A 19900724

Priority
• JP 1831090 A 19900129
• JP 3512190 A 19900215
• JP 11339090 A 19900427
• JP 19296189 A 19890725

Abstract (en)
[origin: EP0418504A2] This invention provides an electrically plastic device in which an electron conjugate polymeric semiconductor layer containing a mobile dopant is formed across a pair of electrodes and at least one gate electrode is provided between said pair of electrodes with an insulating layer or a high-resistance layer interposed along said electron conjugate polymeric semiconductor layer, so that the dopant distribution in said electron conjugate polymeric semiconductor layer is controlled through said gate electrode, thereby controlling the electrical conductivity of said electron conjugate polymeric semiconductor layer. The device utilizes the substantially large variation in the electrical conductivity of an electrically conductive polymer depending on its dopant concentration, thus allowing a high-gain neurochip to be constructed. The control method of the electrically plastic device in accordance with this invention is carried out in such a way that a positive or negative pulse voltage is applied to the gate electrode to control the dopant distribution in the electron conjugate polymeric semiconductor layer, thereby varying the conductivity thereof, which is used as a learning or reset operation so as to make said gate electrode at ground potential so that the pair of electrodes (source and drain) are driven into conduction.

IPC 1-7
H01L 29/784

IPC 8 full level
H01L 29/78 (2006.01); **H01L 51/30** (2006.01); **H01L 51/40** (2006.01); **H01L 51/00** (2006.01)

CPC (source: EP US)
H10K 10/462 (2023.02 - EP US); **H10K 10/464** (2023.02 - EP US); **H10K 10/468** (2023.02 - EP US); **H10K 71/30** (2023.02 - EP US);
H10K 85/111 (2023.02 - EP US); **H10K 85/113** (2023.02 - EP US)

Citation (search report)
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• [A] EP 0185941 A2 19860702 - MASSACHUSETTS INST TECHNOLOGY [US]
• [A] JAPANESE JOURNAL OF APPLIED PHYSICS. vol. 23, no. 8, August 1984, TOKYO JP pages 979 - 983; Masaki Kawano et al: "Effect of Pressure on Electrical Conductivity of Doped Poly (p-Phenylene Sulfide)"
• [A] APPLIED PHYSICS LETTERS. vol. 49, no. 18, 03 November 1986, NEW YORK US pages 1210 - 1212; A. Tsumura et al: "Macromolecular electronic device: Field-effect transistor with a polythiophene thin film"
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US7423292B2; US8334331B2; EP1374321A1

Designated contracting state (EPC)
DE FR GB

DOCDB simple family (publication)
EP 0418504 A2 19910327; **EP 0418504 A3 19910515**; **EP 0418504 B1 19950405**; DE 69018348 D1 19950511; DE 69018348 T2 19950803;
US 5153681 A 19921006

DOCDB simple family (application)
EP 90114130 A 19900724; DE 69018348 T 19900724; US 83655692 A 19920218